

Application No.: 10/782,562
Office Action Dated: September 13, 2005
Response to Office Action Dated: December 8, 2005

REMARKS

This Amendment and Response is submitted in reply to the Office Action dated September 13, 2005, in which the Examiner:

- rejected claims 1, 2, 4-7, 9-13 and 15-18 under 35 U.S.C. § 102(e) as anticipated by U.S. Patent Application Publication No. 2005/0163407 to Kang et al. ("Kang") OR U.S. Patent No. 5,634,723 to Agrawal ("Agrawal");
- rejected claims 3, 8, 14 and 19 under 35 U.S.C. § 103(a) as unpatentable over Kang OR Agrawal, "and further in view of official notice of common knowledge in the art, or, in the alternative, engineering design choice" (Office Action, p. 2);
- required election between "the species of Figure(s) 2-3 versus that of Fig(s). 4" (Office Action, p. 3); and
- required identification of all claims readable on the elected species.

Response to Election Requirement

Applicant hereby elects the species of Figures 2 and 3. Claims 1-3 and 5-19 are readable thereon. This election is made without traverse, but with the understanding that, "Upon allowance of a generic claim, applicant will be entitled to consideration of claims to an additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 C.F.R. § 1.141." (Office Action, p. 4.)

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General

Pursuant to the election requirement, claim 4 is withdrawn. Claims 1, 12 and 13 are amended and claims 9 and 15 are canceled, leaving claims 1-3, 5-8, 10-14 and 16-19 pending upon entrance of the present Amendment. Claims 1, 12 and 13 are independent claims. Applicant respectfully traverses the claim rejections below.

Rejections based on Kang

CLAIMS 1, 12 and 13 (Rejections under 35 U.S.C. § 102(e))

Beyond stating, "The examiner finds all claimed subject matter to be present," the Examiner has not indicated what elements of Kang show or disclose the recitations of Applicant's claims 1, 12 and 13. See 37 C.F.R. § 1.104(c)(2). However, Applicant respectfully submits that Kang does not show or disclose the claim 1, 12 and 13 recitations.

Claim 1, as amended, recites a hydrodynamic fluid film bearing for rotatably supporting a shaft journal, comprising, among other things, a first generally cylindrical foil element disposed within and lining a portion of the cylindrical opening of a stationary retaining member, and a second generally cylindrical foil element disposed within and lining another portion of the cylindrical opening, the second foil element and the first foil element being attached to one another without a key and forming an anti-rotation fin extending generally radially towards the retaining member and being mounted within the slot of the retaining member, wherein the first and second foil elements extend in opposite circumferential directions within the cylindrical opening from the slot and have free ends overlapping one another.

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Amended claim 12, directed to a hydrodynamic fluid film bearing, and amended claim 13, directed to a keyless hydrodynamic fluid film bearing foil assembly, each include similar recitations.

Kang does not show or disclose first and second foil elements which extend in opposite circumferential directions within the cylindrical opening from the slot. In Figs. 4A, 4B, 5 and 7-10, Kang shows only a single top foil 18 with a leading edge 60 and a trailing edge 50 meeting the foil retention slot 28. This single top foil 18 may be backed by multiple undersprings (e.g., 22A, 22B in Fig. 4A). However, these undersprings (resilient backing members) do not act as or supplant the first and second foils of Applicant's present invention. Additionally, as these Figures show only one top foil 18, first and second foil elements with free ends or flex portions overlapping one another are not shown or disclosed.

Fig. 6B of Kang arguably shows multiple top foils 18, but none of these foils extend in opposite circumferential directions from the slot, or have free ends or flex portions overlapping one another.

Kang also fails to show or disclose the second foil element and the first foil element being attached to one another. Even if the single top foil 18 of Figs. 4A, 4B, 5 and 7-10 were somehow to be considered to constitute two foils, Kang does not show or disclose that leading edge 60 and trailing edge 50 are attached in slot 28. At most, Kang discloses that the ends of top foil 18 abut in slot 28. (Kang, paragraph [0058].) Fig. 6B does not show or disclose any abutment, much less attachment, of any portion of the top foils 18.

Accordingly, Applicant respectfully submits that claims 1, 12 and 13 are allowable for at least the reasons stated above.

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CLAIMS 2-3, 5-8, 10-11, 14 and 16-19 (Rejections under 35 U.S.C. §§ 102(e) and 103(a))

Claims 2-3, 5-8, and 10-11 depend, directly or indirectly from claim 1. Claims 14 and 16-19 depend, directly or indirectly from claim 13. Accordingly, Applicant respectfully submits that claims 2-3, 5-8, 10-11, 14 and 16-19 are allowable over Kang for at least the reasons stated in connection with claims 1 and 13.

Rejections based on Agrawal

CLAIMS 1, 12 and 13 (Rejections under 35 U.S.C. § 102(e))

Applicant respectfully notes that Agrawal does not qualify as prior art under 35 U.S.C. § 102(e) at least because the subject matter of Agrawal does not constitute an invention described "by another." In the interest of furthering prosecution, Applicant will respond to the Examiner's rejections based on Agrawal as if made under 35 U.S.C. § 102(b).

As was the case with the rejections based on Kang, Applicant notes that the Examiner has not stated what elements of Agrawal show or disclose the recitations of Applicant's claims 1, 12 and 13. However, Applicant respectfully submits that Agrawal does not show or disclose the recitations of the amended claims 1, 12 and 13.

Claim 1, as amended, recites a hydrodynamic fluid film bearing for rotatably supporting a shaft journal, comprising, among other things, a first generally cylindrical foil element disposed within and lining a portion of the cylindrical opening of a stationary retaining member, and a second generally cylindrical foil element disposed within and lining another portion of the cylindrical opening, the second foil element and the first foil element being attached to one another without a

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key and forming an anti-rotation fin extending generally radially towards the retaining member and being mounted within the slot of the retaining member, wherein the first and second foil elements extend in opposite circumferential directions within the cylindrical opening from the slot and have free ends overlapping one another.

Amended claim 12 includes similar recitations. Claim 13, as amended, recites a keyless hydrodynamic fluid film bearing foil assembly adapted to be supported in a bearing housing for journaling of a shaft, comprising a first generally cylindrical foil element having a fin portion projecting from said first foil element in a radial direction generally normal to the circumferential direction thereof, and a flex portion extending from the fin portion in the circumferential direction, and a second generally cylindrical foil element having a fin portion projecting from said second foil element in a radial direction generally normal to the circumferential direction thereof, and a flex portion extending from the fin portion in the circumferential direction, wherein the flex portions of the first and second foil elements have overlapping portions with the second foil element flex portion being disposed radially inwardly from the first foil element flex portion, and wherein the fin portion of the first foil element is attached to the fin portion of the second foil element to form an anti-rotation fin and the respective flex portions of the first and second foil elements extend from the fin in opposite circumferential directions.

Agrawal does not show or disclose keyless, attached first and second foil elements extending in opposite circumferential directions wherein free ends or flex portions of the attached first and second foils are overlapping. Although Agrawal discloses overlapping free ends or flex portions of *adjacent* foil elements and keyless attachment of foil elements (see, e.g., Figs. 3 and 3A), Agrawal is directed to "multi-

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pad" bearing configurations and does not show or disclose any overlapping free ends or flex portions of *keylessly attached* foil elements, as recited by claims 1, 12 and 13.

The present invention is directed to a single-pad bearing configuration. The principles of operation of a single-pad bearing configuration differ from those of multi-pad bearing configurations in many respects. One particularly significant difference, relative to the use or absence of a key, is that single-pad bearing configurations must handle a continuous pressure distribution with a resultantly high load on the foil assembly. The pressure distribution in a multi-pad bearing configuration is pulsed, resulting in a lower load for each foil assembly. Thus, the attachment points in a multi-pad bearing configuration require less strength, making it easier to omit the key, whereas omission of the key in a single-pad configuration was not known or possible until the present invention.

Accordingly, Applicant respectfully submits that claims 1, 12 and 13 are allowable over Agrawal for at least the reasons stated above.

CLAIMS 2-3, 5-8, 10-11, 14 and 16-19 (Rejections under 35 U.S.C. §§ 102(e) and 103(a))

Claims 2-3, 5-8 and 10-11 depend, directly or indirectly from claim 1. Claims 14 and 16-19 depend, directly or indirectly from claim 13. Accordingly, Applicant respectfully submits that claims 2-3, 5-8, 10-11, 14 and 16-19 are allowable over Agrawal for at least the reasons stated in connection with claims 1 and 13.

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Withdrawn Claims

CLAIM 4

Claim 4, withdrawn in response to the election requirement, depends directly from claim 1. As claim 1 is allowable for at least the reasons previously stated, Applicant respectfully submits that claim 4 is entitled to consideration and allowance for at least those same reasons.

Conclusion


Applicant respectfully submits that nothing in the current Amendment constitutes new matter. Amendments to claims 1, 12 and 13 incorporated dependent claim recitations and/or find support at least in paragraph [0014] of the Specification.

As Applicant has traversed each and every rejection made by the Examiner, it is respectfully requested that claim 4 be reinstated, the rejection of claims 1-8, 10-14 and 16-19 be withdrawn, and claims 1-8, 10-14 and 16-19 be passed to issue.

Applicant respectfully submits that no fees are due in connection with this Amendment and Response. If any fees are deemed necessary, the Commissioner is hereby authorized to charge them to Deposit Account No. 13-0235.

Very respectfully submitted,

By


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